

WHEAL MARTYN 'UPPER PROCESSING PLANT', CARTHEW, NEAR ST AUSTELL, CORNWALL

(NGR SX 00101 55486)

Results of archaeological recording

Cornwall Council planning reference NR/02/00134/ROMPS -
OA17 Greensplat

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On behalf of:
Imerys

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archaeology

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Summary

Archaeological recording was undertaken by AC archaeology in April 2016 at the site of mica drags, settling pits and tanks surviving at the edge of the Wheal Martyn China Clay Pit, Carthew, near St Austell, Cornwall. The work was undertaken on behalf of Imerys Minerals Ltd in advance of the extension of the working clay pit. According to map evidence, the features recorded at the 'Upper Processing Works' were constructed between 1879 and 1906, at a time when the clay works were developed by John Lovering & Co. The site was incomplete but three well preserved settling pits were of particular interest.

1. INTRODUCTION (Fig. 1)

- 1.1 This report describes the recording undertaken at a former China clay processing plant at Wheal Martyn by AC archaeology on 20 April 2016. The investigation was commissioned by Imerys Minerals Ltd and was required under condition 4.4iv of the grant of permission for "re-commencement of mineral operations outside the approved working area" by Cornwall Council as the minerals planning authority (reference NR/02/00134/ROMPS – OA17 Greensplat, [R10.Env.OA17 (1)] Submission of scheme relating to existing planning permissions for winning and working of china clay). The original name of the site is not known, but it is called the 'Upper Processing Plant' for clarity in the report.
- 1.2 The location of the site at SX 00101 55486 is shown on Fig. 1. The underlying geology comprises partly kaolinised lithium-mica granite of the St Austell igneous intrusion. The site is located at 195m aOD on historically exploited land between the current china clay pit and the old main processing plant, now the Wheal Martyn China Clay Museum, which is situated at 160m aOD beside the B3274 in the St Austell River valley. The Upper Processing Plant site was adjacent to the boundary of the Wheal Martyn Museum property.
- 1.4 The 'Upper Processing Plant' was formerly in a shallow valley carrying a small stream, half-way between the early china clay pit and the main processing plant down in the valley. Its purpose was to refine the china clay to a state suitable for further thickening before it was dried and stored ready for sale. The surviving remains cover an area of approximately 600 square metres.

2. HISTORICAL BACKGROUND

- 2.1 Wheal Martyn was among the earlier china clay works in the St Austell district. It was, in effect, on two sites: (1) the china clay pits excavated on higher ground and (2) the processing works down below to which clay slurry was piped to be refined and dried (the latter is now a museum). The land was bought by Richard Martyn in 1790 and his son Elias built Carthew House close to the clay pits and works which he developed in the 1820s. He had other clay interests including Ninestones, Union, Vale Pleasant and Shelton. In 1858 Wheal Martyn produced 500 tons of bleaching and potting clay. Ten years later, Elias Martyn & Sons had increased output here to 2,000 tons. Elias died in 1872 and his son Richard Uriah Martyn gradually withdrew from the business. The Wheal Martyn pit and works were taken over in 1880 by John Lovering who also acquired other properties. He was an innovator and had been involved in devising an improved mica trap which was controlled by a float in a cistern rather than relying on hand-operation (Barton 1966, 135). It was Lovering who redeveloped the processing works that form the Wheal Martyn Museum today. Wheal Martyn was among seven pits being worked by John Lovering & Co. in the 1920s. However, the Wheal Martyn pit was closed in 1931, a year before Lovering & Co. joined with two other main clay producers to form

English China Clays Lovering Pochin & Co. Ltd (ECLP), the major group which later became English China Clays International and more recently, Imerys Minerals Ltd.

- 2.2** Although work at the Wheal Martyn pit had ceased, the main processing plant and kilns were retained until the 1960s for treating low-grade clay from other pits. A museum was opened here in 1975 and the main part of the processing site was designated a Scheduled Monument in 1979 (National Heritage List for England no. 1003265). Meanwhile, the Wheal Martyn pit was re-opened in 1971, with the clay slurry sent by pipeline for refining at other sites. Today (2016) it is so enlarged that it combines both the historic Wheal Martyn and Greensplat workings.

3. HISTORIC MAPPING EVIDENCE (Figs 2-5)

- 3.1** This section of the report is based on a map progression exercise undertaken on a series of historic maps relating to the area of the proposed quarry extension. Phases in the development of Wheal Martyn, which are relevant to the Upper Processing Plant, are shown on a sequence of maps and described in detail here.

3.2 Phase 1, 1820s-39 (Fig. 2)

The St Austell Tithe Map of 1839 marks 'Wheel [*sic*] Martyn Clay Work' with three buildings or settling pits at the site that was to develop into the main processing plant. In the apportionment these are described as 'Plantations and Clay Works', owned by Elias Martyn. A stream runs down through the property from further up the hill where the ground later destroyed by the Wheal Martyn clay pit is divided into small fields under pasture, arable and some waste. All is under Martyn's ownership but leased out. There is a dwelling (with garden) occupied by Jane Jacob. To the southeast, John Warrick farms five small enclosures around four buildings known as 'Town Place'; oddly, the apportionment does not mention a dwelling at this location.

Upper Processing Plant (site)

Town Place is the future site of the Upper Processing Plant. To its south, across the stream, Elias Martyn owns a large plot which is described as Outer Downs, rough pasture. The adit, which features in the history of the site, is indicated but not named. Immediately west across the stream and property boundary is the 'Greensplatt Clay Work' on land owned by Sir Joseph Sawle Graves and John Hearle.

3.3 Phase 2, 1839-79 (Fig. 3)

The first Ordnance Survey 25-inch scale map was surveyed in 1879 and shows the layout of the property developed by Elias Martyn, just at the time John Lovering took over and began to expand the workings. The map names the 'Wheal Martin [*sic*] China Clay Works' in the higher, west part of the property with a number of shallow clay pits, ponds and small waste tips. These have encroached onto fields shown on the earlier Tithe Map. A clay pit has also devoured Jane Jacob's dwelling. To the northeast of the former dwelling are located one large and two small round settling pits, to which clay slurry must have been pumped from the extraction pits for an early stage of refining.

The stream still flows through the site and descends through woods to the main Wheal Martyn processing works (not named) near the valley bottom where settling tanks and kilns are laid out. Here, a small wheelpit (unnamed) may represent the 35ft waterwheel still extant at the museum, or an earlier wheel. This waterwheel operated flat rods which ran uphill to work a pump at a shaft c. 70m southeast of the three round settling pits. Near the shaft is a drainage adit (not named) from which a tramway runs south onto a small tip. A stream emerges onto what may be sand and/or mica drags.

To the south and west, the Greensplat China Clay Works appears well established, with clay pits, shafts, engine house, chimneys, and numerous settling pits. A small stream drains from the site to join the Wheal Martyn stream.

Upper Processing Plant (site)

The future site of the Upper Processing Plant ('A' on Fig. 3) is shown as scrubland on the north side of a shallow but extensive extraction pit. The earlier Town Place has gone, and its area is shown as scrub in the corner of an enlarged field. Only one small enclosure on its east side is retained, also as scrub.

3.4 Phase 3, 1879-1906 (Fig. 4)

By 1906 the revised 25-inch scale Ordnance Survey map confirms the developments which had taken place under John Lovering & Co. The Wheal Martyn clay pits had been greatly expanded in area and depth. One pit is served by an inclined skip tramway to a sand tip, the beginnings of the classic 'sky tip' method of waste disposal in the china clay district. Sand traps are shown at the bottom of the pit, and at the top is an engine house for a steam pumping (also winding?) engine. The three round settling pits seen in 1879 have been buried beneath waste tips and replaced by the Upper Processing Plant which has been constructed lower down to the southeast.

A tramway still emerges from the adit (not named) but it now extends east around the Upper Processing Plant before curving northwards onto a new flat-topped tip covering a large area above the valley side. A large quantity of material had been trammed through the adit as the clay pits deepened. The furthest extension of the tip is the reason for the tunnel constructed over the waterwheel flat rods (Wheal Martyn Museum site 51). The tunnel is not shown on the map, but the line of the flat rods is indicated by a broken line aligned with the shaft. The old stream enters two ponds of curious shape near the adit and passes out through a sluice under the tramway. It is now re-aligned south of the new processing plant before a major diversion around the north side of the tip. It rejoins its original course further down the hill and then runs underground at the main processing works where the pan kiln has been extended and new tanks added, served by a new track from the valley road. This layout is largely preserved in the Wheal Martyn Museum today.

Upper Processing Plant

The 'Upper Processing Plant' has been constructed on the north side of the spoil tip which has covered most of the earlier shallow pit. The main features are two round settling pits on the east side, a long, tapered settling pit to the north, and a rectangular tank and five-sided tank to the south. Between the long pit and the tanks, mica drags are represented as a long, narrow feature with four divisions, entering the site from the west where it is fed by a stream from the adit tunnel of the deepened clay pit. A small square building is shown between the east end of the drags and the pair of round pits. At least part of the long settling pit may overlie the former Town Place site. There is an unexplained terrace in woodland to the northeast.

3.5 Phase 4, 1906-33 (not illustrated)

Upper Processing Plant

The 1933 Ordnance Survey 25-inch scale map revision shows no changes to the layout of the Upper Processing Plant, although the tramway has been removed from the large tip to the south and east. A cross-shaped feature south of the Upper Processing Plant may have been the beginning of a sky tip.

3.6 Phase 5, 1933-70 (not illustrated)

This is the period of abandonment of the clay pit. The Wheal Martyn clay pit is recorded as disused on the Ordnance Survey 1:10560 scale map of c. 1963.

Upper Processing Plant

It is likely that the Upper Processing Plant was abandoned at the same time as the clay pit. The plant is depicted but not named on the c. 1963 map. By c. 1970, the Ordnance Survey 1:2500 scale map shows the tanks as 'disused'. These are the long settling pit, two round pits and the five-sided settling tank. The south wall of the rectangular tank has been destroyed by a clay pit track. There is no longer a small building, but hints of the channel and south wall of the mica drags, with a 'drain' leading from the adit (named) which is 100m to the WNW.

3.7 Phase 6, c. 1970-99 (not illustrated)

By c. 1992 the 1:10000 scale Ordnance Survey map shows the revived Wheal Martyn pit has expanded on an enormous scale and almost joined with the Greensplat Pit.

Upper Processing Plant

The map of c. 1992 shows the long pit, a single round pit, the adit and drain. Three walls of the rectangular tank survive, the five-sided tank has gone, but a new shapeless feature is depicted a little to the south. In 1999 a Wheal Martyn gazetteer key map (Smith 1999, Fig. 2) shows the drain, the long pit and two round pits. Faint lines indicate the three walls of the rectangular tank, a channel and the shapeless feature.

3.8 Phase 7, 1999-2016 (not illustrated)

The current Cornwall Council interactive map shows that the two china clay pits have coalesced into a single excavation, within which the name 'adit' still appears. The stream of water flowing down through the museum is supplied artificially and pumped by Imerys to the head of the site near the Upper Processing Plant.

Upper Processing Plant

Labelled as 'Tanks (dis)', the map shows the long, tapering pit, two round pits, the north and east walls of the rectangular tank, and part of channel.

4. ARCHAEOLOGICAL BACKGROUND

4.1 The Upper Processing Plant site is recorded on the Cornwall & Scilly Historic Environment Record (no. 20021.06; MCO42030) as a 'set of mica-drags and settling pits at Wheal Martyn' at SX 0010 5546.

4.2 An archaeological assessment of the Wheal Martyn China Clay Museum prepared by the Cornwall Archaeological Unit in 1999 referred to the site as 'Tanks and Settling Pits' (Site 69), dated between 1880-1907. Surviving features included 'a large trapezoidal pit and two circular pits, all granite-lined and ca 3-4m deep' which were very overgrown and threatened by expansion from the modern pit. The report considered the pits were 'of prime historic importance and a key part of the Wheal Martyn story.' They were outside the museum boundary, so it was recommended that a renegotiated lease should include them and a nearby angle bob plinth (Site 64) to secure their future, while providing a buffer zone against modern expansion of the clay pit (Smith 1999, 13 and 46). Only the angle bob plinth was brought within the museum lease.

4.3 The two round pits, along with a large shapeless cut feature under the adjacent track to the south, were recorded as part of the National Mapping Programme (reference 20087).

5. AIMS AND METHODOLOGY

- 5.1 The principal aim of the recording was to provide an archive record of the processing plant, prior to demolition.
- 5.2 The recording was undertaken in accordance with a Written Scheme of Investigation prepared by AC archaeology (Passmore 2016), and to the Chartered Institute for Archaeologist's *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures* (2014). It was carried out to Levels 2/3 surveys, as set out in Historic England's document *Understanding Historic Buildings: A Guide to Good Recording Practice* (2016)
- 5.3 Background information on the site was obtained from the Cornwall Archaeological Unit report of 1999, past editions of the museum guide (e.g. Moore, 2012), publications on the history of the china clay industry and accounts of the working methods for mica drags, settling pits and settling tanks (Barton 1966; Collins 1878; and Smith 1992). Unfortunately, no comprehensive history of Wheal Martyn has been published. Maps consulted to trace the history of the site included the St Austell Tithe Map of 1839 and large-scale Ordnance Survey maps surveyed from 1879 onwards.
- 5.4 Recording was undertaken with due consideration of health and safety issues. The site had become extremely overgrown, but much of its area was cleared by mechanical flails a few weeks prior to the recording. Broken stumps and strewn branches were a trip hazard, especially close to the edge of deep pits. The long, tapering pit and two round pits were still vegetated, making measurements difficult. While strewn branches could be lifted aside, it was often only possible to estimate depths of buried features because of a dense matting of soil and roots. This was particularly true of the main channel, surface of the mica drag platform and the demolished area to its east. The interior of the trapezoidal tank was silted to an unknown depth. The two round pits were inaccessible, each being an estimated 4m deep.
- 5.5 Plans and sections of the structures, pits, tank and channel were measured to a scale of 1:100 (Figs 6 and 7). The main features of the site were recorded by digital photographs (Appendix 1).

6. RESULTS (Figs 6-7; Plates 1-22; Appendix 1)

6.1 Introduction

The Upper Processing Plant was constructed on partly disturbed ground consisting of sandy material deposited from the early china clay workings. The site had become densely overgrown with rhododendron, willow and some gorse scrub before clearance by machinery prior to the survey. A perimeter roadway for the working china clay pit passed through the south edge of the site and ground had been disturbed and waste dumped over the west part (Plate 1). The main alignment of the site was west-east and all walls were built of undressed granite and quartzite rock most likely taken from the unkaolinised material ('stent') encountered in the china clay pits. The extent of survival is shown on Fig. 5. The features were recorded as follows:

6.2 Long Settling Pit (Plates 2-5)

This major feature of the site was a long, sunken pit with rubble stone walls. In plan it was rectangular at the west end but tapered towards a rounded east end. The rough coping stones along the south edge were broken by three features. At the west end was a gap in the coping, either constructed or where damaged coping had fallen away (LSP.1), but towards the east end was an opening 800mm wide and c. 350mm deep which tapered towards a buried earthenware pipe, interpreted as an inflow to fill the pit with clay slurry (LSP.2). Almost at the

east end, a very narrow (100mm) slot gave access to a shaped basin filled with earth to 200mm but which perhaps measured 350mm deep (LSP.3). A channel 150mm wide connected with the top of Round Settling Pit 1.

Inside the pit, the moss-covered walls were slightly battered to a depth of c. 3m before its base was buried with silt, rubble and vegetation including trees. Near the base at the northeast end a small rectangular opening was perhaps one of several places for draining the pit (LSP.4).

6.3 Round Settling Pit 1 (Plates 6, 7 and 11)

This was the north pit of a pair and measured c. 5.5m in diameter. It was built of rough stone, some of which formed a coping around the top. The coping was slightly distorted on the east side, perhaps where the supporting ground had been excavated away. At the top on the north side was the narrow channel and feature described above (LSP.3), while on the southwest side a small recess (RSP1.1) served as an inflow point for a buried earthenware pipe of 230mm (9ins) internal diameter, leading from the demolished area. Flat ground separated this pit from Round Settling Pit 2, and a narrow groove, 200mm wide and c. 250mm deep, connected the tops of both pits (RSP1.2). Internally, the sides of the stone-lined pit began to taper sharply inwards at a depth of c. 2.8m, creating an inverted cone shape. The lower part was silted but the full depth of the pit must exceed c. 4m. Trees still grew within the pit, making it difficult to record.

6.4 Round Settling Pit 2 (Plates 6-12)

The south pit matched its twin, with similar construction materials and dimensions, and likewise still filled with growing trees. The ground had been excavated very close to the coping on the east side, although there was no evidence of collapse. At the top on the northwest side was a small recess (RSP2.1) serving as an inflow point for an earthenware pipe of 230mm (9ins) internal diameter, leading from the demolished area. In front of the pipe were two small upright timbers 200mm apart, which could have held hatch boards for controlling the flow of clay slurry. A pipe of unknown diameter was observed half-way down the moss-covered wall on the southwest side (RSP2.2). Of greater interest, a long iron rod with a mechanism attached (RSP2.3) lay in the pit, leaning against the wall immediately below the narrow groove which connected the two pits, described above. This may have been part of a mechanism connecting both pits, lying in the groove, or a mechanism for discharging the pit from an opening now buried at the base.

6.5 Settling Tank (Plates 13-15)

This rectangular stone-walled tank was incomplete. The south and west walls were demolished, and boulders placed across this area gave some protection from traffic on the clay pit track. Most of the north and east walls of rubble stone survived for a length of c. 7.5m each. The depth of this tank was only 1.4m to 1.7m down to the fill and the base was considered to be not far beneath. The east wall was truncated by the modern clay pit roadway at a point where its construction included dressed stones, perhaps indicating the location of a hatch for discharging the pit (ST.1). This destruction also provided a cross-section showing the wall to be 700mm wide at the top and 1m at the base. The ground behind the wall was of quartz sand material derived from previous waste tips. The face of the north wall was slightly battered, above which was a flat area c. 2.2m wide. The two walls were poorly joined at the corner. Here, on the north wall were two small iron spikes of unknown function (ST.2).

6.6 Channel (Plates 16-17)

A channel aligned west-east ran between the parallel Settling Tank and the Mica Drags Platform. It disappeared beneath debris towards the west, but it turned slightly at the east end into a buried earthenware pipe of 230mm (9ins) internal diameter (C.1). The channel was c. 550mm wide and 350mm deep to the fill material. A small overflow outlet 250mm wide and 200mm deep was observed cut into the south bank which was encrusted with clay (C.2).

6.7 Mica Drags Platform (Plates 3, 18-20)

Only a short length of the east end survived of the original mica drags which were recorded as 40m long on the historic Ordnance Survey maps. The rest had been either demolished, buried under rubble or vanished in the void of the modern china clay pit. What survived was a platform measuring c. 13.5m long and 900mm high, partially buried and damaged. The position of the drags was indicated by a very shallow depression c. 4.2m wide between two broad platforms. Within, the trace of two cross channels (MDP.1 and MDP.2) were probably the sites of drain channels under the drag for discharging waste fine silt and mica. Damage to the south wall was probably caused by the passing of machinery and stones had become loosened or fallen away. Most of the raised east end wall had been damaged but the moss-covered south part survived (MDP.3), with a set of three stone or concrete steps alongside (MDP.4). These steps would have given access to the top of the mica drags.

6.8 Demolished Area (Plate 21)

A small square building was marked between the mica drags and north round pit on the Ordnance Survey maps of 1906 and 1933. This area was the scene of recent damage by machinery, leaving it strewn with broken stone, brick and concrete block rubble. A buried depression near the east wall of the mica drags may have been the position of the final drain for the refined clay slurry (DA.1). The most notable feature was an almost square pit (measuring 800mm x 900mm) constructed of concrete blocks and rendered inside with cement (DA.2). It was open to a depth of 900mm after which it was filled with debris. A complete brick from the demolition debris, which had fallen into the pit, was stamped 'CARBIS'. The brick measured 230mm x 110mm x 63mm (9ins x 4 ½ ins x 2 ½ ins) and was a product of the Carbis Brickworks which operated in 1883-1942 just a few miles away near Roche (Ferguson and Thurlow 2005, 76-79).

6.9 Boundary Wall (Plate 22)

A dry-stone wall on a slight angle near the northwest corner of the Long Settling Pit may have been one of the earlier small field walls at Town Place recorded on the Tithe Map of 1839 and remaining on the 1879 Ordnance Survey map. If so, it had become incorporated into a retaining wall shown in 1906 (Fig. 4).

6.10 Other observations

A cast-iron pipe of 230mm (9ins) internal diameter lay partially buried c. 8m southwest of the southwest corner of the Long Settling Pit. It was of a type commonly used for rising mains when pumping on mines or clay pits, with a flange at the end pierced with holes for the bolts to join it to the next pipe. Although appearing to be aligned with the site, it could not be *in situ* as it was within tipped debris overlying the site of the west area of the mica drags platform.

7. DISCUSSION

7.1 The site was an integral part of the late 19th-century developments at the Wheal Martyn clay works. It was chosen on a site close to the adit mouth where flat land was available rather than in the restricted valley site below, to which it sent refined clay slurry by pipe for further processing and drying.

7.2 The layout and processes involved for the mica drags and settling pits and tanks at the Upper Processing Plant are similar to those described in late Victorian times (Collins 1878, 18-20). After being washed from the pit face, very coarse sands were trapped and removed to tips before the 'clay water' was pumped out for processing. Ideally, this clay ran out through an adit before purifying in mica drags and pits placed at a lower level. Any remaining sand or silt was trapped in drags and the 'clay water' (about 2% clay) continued to the 'micas' which were long,

narrow channels separated by wooden boards (a good example is displayed at Wheal Martyn Museum). Their very slight incline, with occasional traps, caused the finest silt and mica to be deposited. Flow was controlled by a system of hinged flaps. The channels were periodically cleaned using a 'shiver' hoe, and plug holes were opened to discharge into underground drains. This material was directed into pits or tanks if it was considered to have value as inferior or 'mica clay', while large volumes were discharged into streams which caused widespread pollution. The refined clay flowed to the end of the mica drags and was settled in deep, round pits constructed of rough masonry with a paved bottom. Each pit had a 'pin-hole launder' which was an upright wooden pipe with closely spaced holes inserted with wooden pins. As the clay settled in the pit, the nearly clear water at the top was allowed to escape by gradually removing pins from the launder holes. When the pit was nearly full, the concentrated slurry of 10-15% clay was discharged by opening a hatch or plug in an outlet at the bottom. This flowed by gravity to rectangular storage tanks for further thickening, but in the case of the Upper Processing Plant a pipe would have taken the slurry much further down to tanks behind the pan-kiln at the main processing plant.

- 7.3** The measured plan (Fig. 6) highlights discrepancies in the Ordnance Survey maps which have been the base for most maps in the past. For example, it was discovered that the Round Settling Pit 1 was closer to the Long Settling Pit (their close proximity might account for a slight bow observed in the latter's wall near this point). Also, the Long Settling Pit does not extend as far east as shown on the Ordnance Survey maps.
- 7.4** The recording work at the Upper Processing Plant observed only the stone-built features at the surface. Any mica drag boards, wooden launders and hatches (sluices) had all been removed, and pipes and drains which might help interpret the flow of clay through the site were presumed to remain buried so their location and arrangement could not be determined precisely.
- 7.5** Earthenware ('cloam') pipes were commonly used for distributing clay slurry at china clay works and all those seen at the Upper Processing Plant were of 230mm (9ins) internal diameter. Flanges on the pipes should indicate the flow direction although this was not always consistent with the interpretation, unless pipe joints were less critical if they became sealed with clay.
- 7.6** One interpretation of the site is that the fine clay draining from the east end of the Mica Drags was controlled from a distribution point in the area now demolished. Here the Ordnance Survey maps show a small building which could have served this purpose, while it may also have been a blueing house where discoloration in the clay was removed. Earthenware pipes emerged from this direction at the sides of the two Round Settling Pits, while a third pipe appears to have fed the notably deep Long Settling Pit. A fourth earthenware pipe ran to the Channel, allowing the clay to flow westwards where it probably fed the relatively shallow rectangular Setting Tank and the now destroyed five-sided settling tank. Both tanks were at the same level as the round pits, so they were independent and could not have received clay from the latter without pumping.
- 7.7** The function of the basin connecting the Long Settling Pit and Round Settling Pit 1 is unclear but could have regulated levels in the two pits; the narrow grooved channel between the two Round Settling Pits could have done the same.
- 7.8** Stray finds can be informative, even if out of context. The single cast-iron pipe was not considered directly related to the site, but was a common type of working barrel and could have come from the pump operated in the shaft near the adit. Ideally, it belonged with other large artefacts nearby which were seen set aside at the clay pit boundary and visible from the Museum pathway. These included a wrought-iron domed shot-firer's shelter and three cast-iron

items relating to pumping: a working barrel, clack piece door and a wind bore.

8. ARCHIVE AND OASIS ENTRY

- 8.1 The paper and digital archive is currently held at the offices of AC archaeology Ltd under the project number ACD1359. Agreement will be reached with the Royal Cornwall Museum, Truro concerning deposition and long-term storage of the project archive. A copy of the report will be deposited with Cornwall and Isles of Scilly HER.
- 8.2 An online OASIS entry has been completed, using the unique identifier 252145, which will include a digital copy of this report.

9. ACKNOWLEDGEMENTS

- 9.1 The archaeological monitoring was commissioned by Imerys Minerals Ltd. The project was managed for AC Archaeology by John Valentin and Andrew Passmore. The fieldwork was undertaken by Peter Stanier with the illustrations prepared by Peter Stanier and Stella De-Villiers.

10. SOURCES CONSULTED

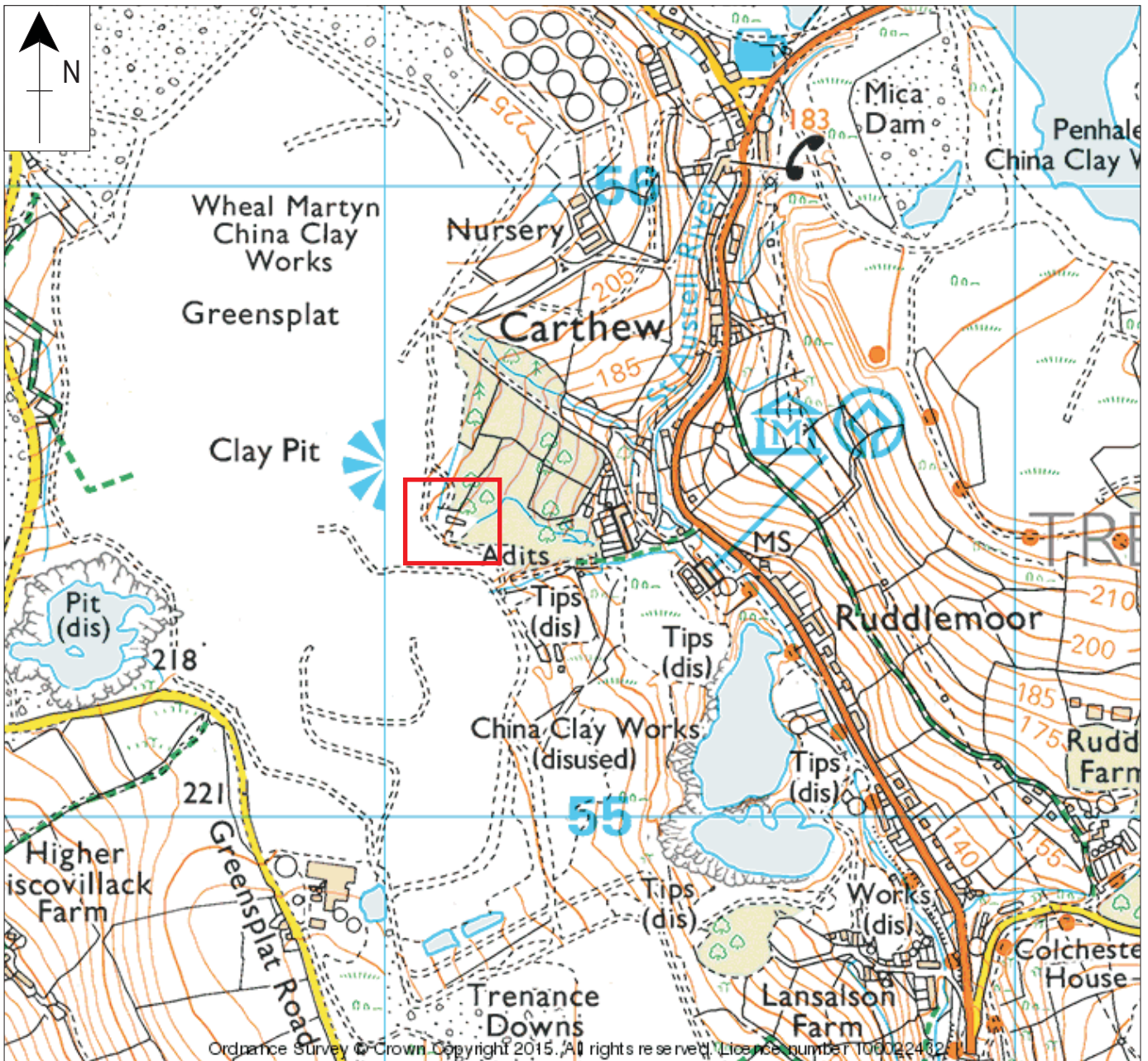
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Maps

- St Austell Tithe Map and Apportionment, 1839
- 25-inch OS map Cornwall L.3, surveyed 1879, published 1881
- 25-inch OS map Cornwall L.3, revised 1906, published 1907
- 25-inch OS map Cornwall L.3, revised 1932-3, published 1934
- 25-inch OS map Cornwall XLI.15, surveyed 1879, published 1881
- 25-inch OS map Cornwall XLI.15, revised 1906, published 1907
- 25-inch OS map Cornwall XLI.15, revised 1932-3, published 1934
- 6-inch OS map Cornwall L.NE, surveyed 1879-81, published 1888
- 6-inch OS map Cornwall L.NE, revised 1906, published 1908
- 6-inch OS map Cornwall L.NE, revised 1932, published 1934
- Cornwall Council Interactive Map (<http://map.cornwall.gov.uk>)

Website

- National Heritage List for England
<https://www.historicengland.org.uk/listing/the-list/>

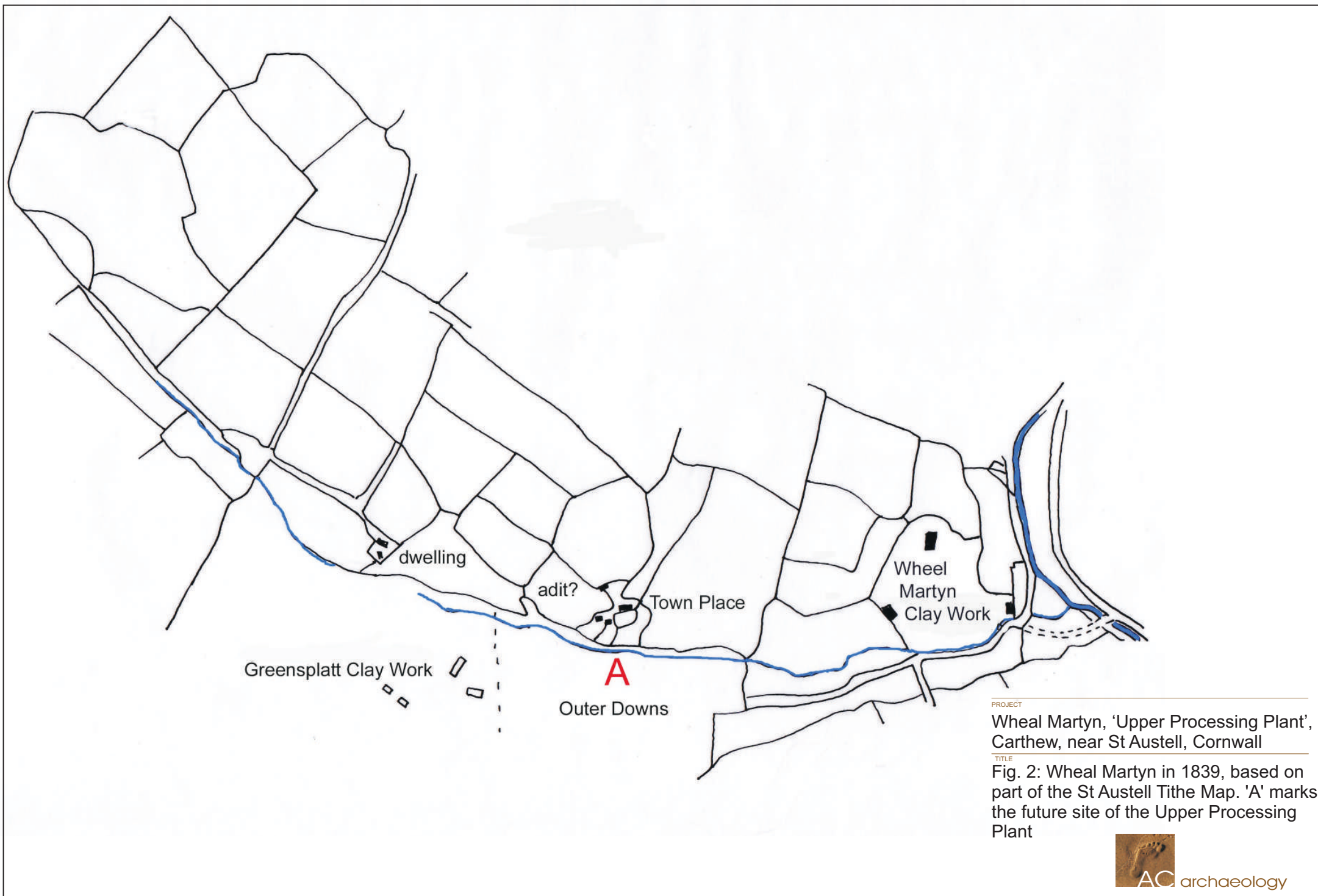


PROJECT

Wheal Martyn, 'Upper Processing Plant',
Carthew, near St Austell, Cornwall

TITLE

Fig. 1: Location of site





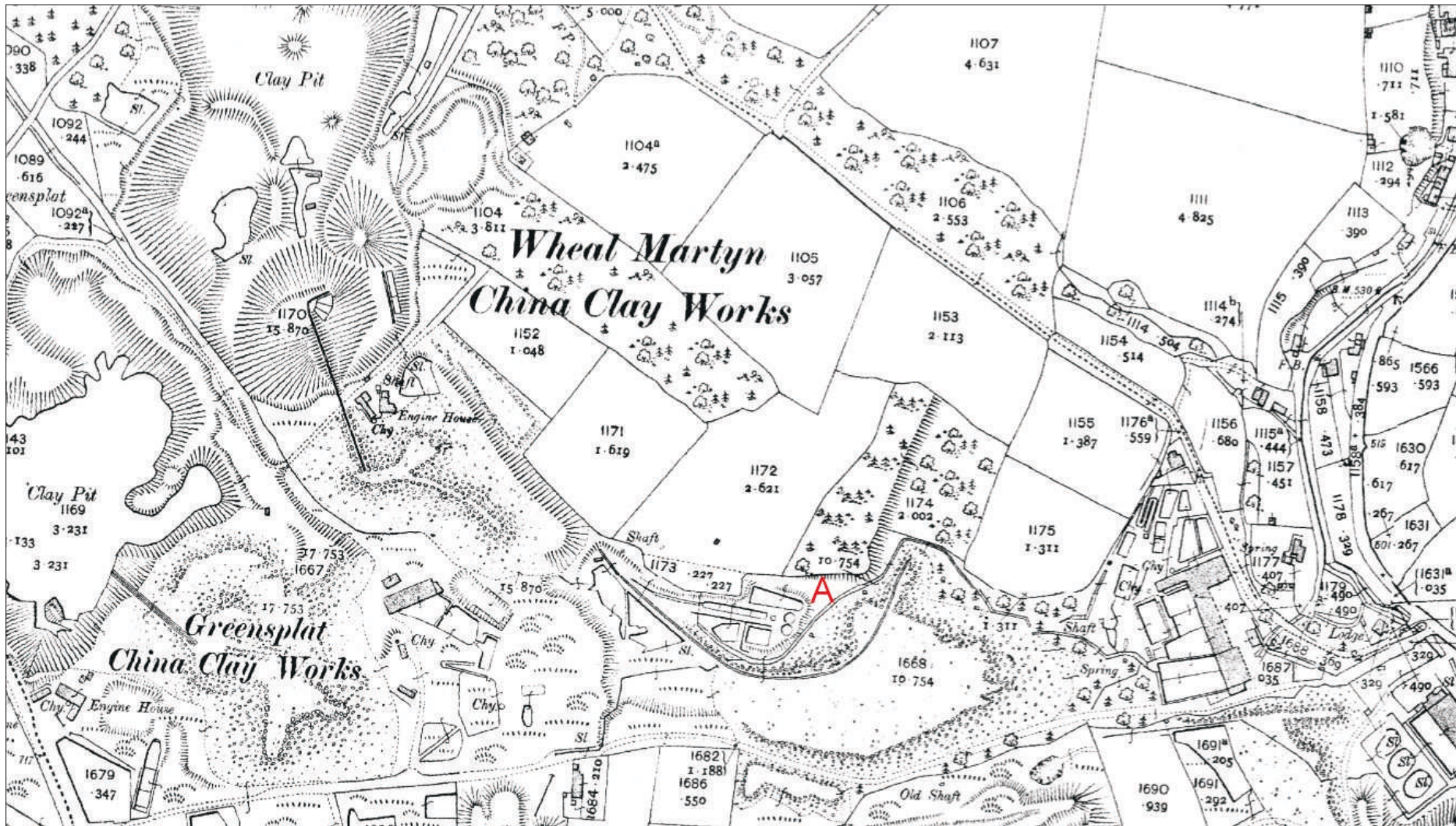
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PROJECT

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Fig. 3: Wheal Martyn in 1879, extract
from the OS 25-inch map published
1880. 'A' marks the future site of the
Upper Processing Plant.



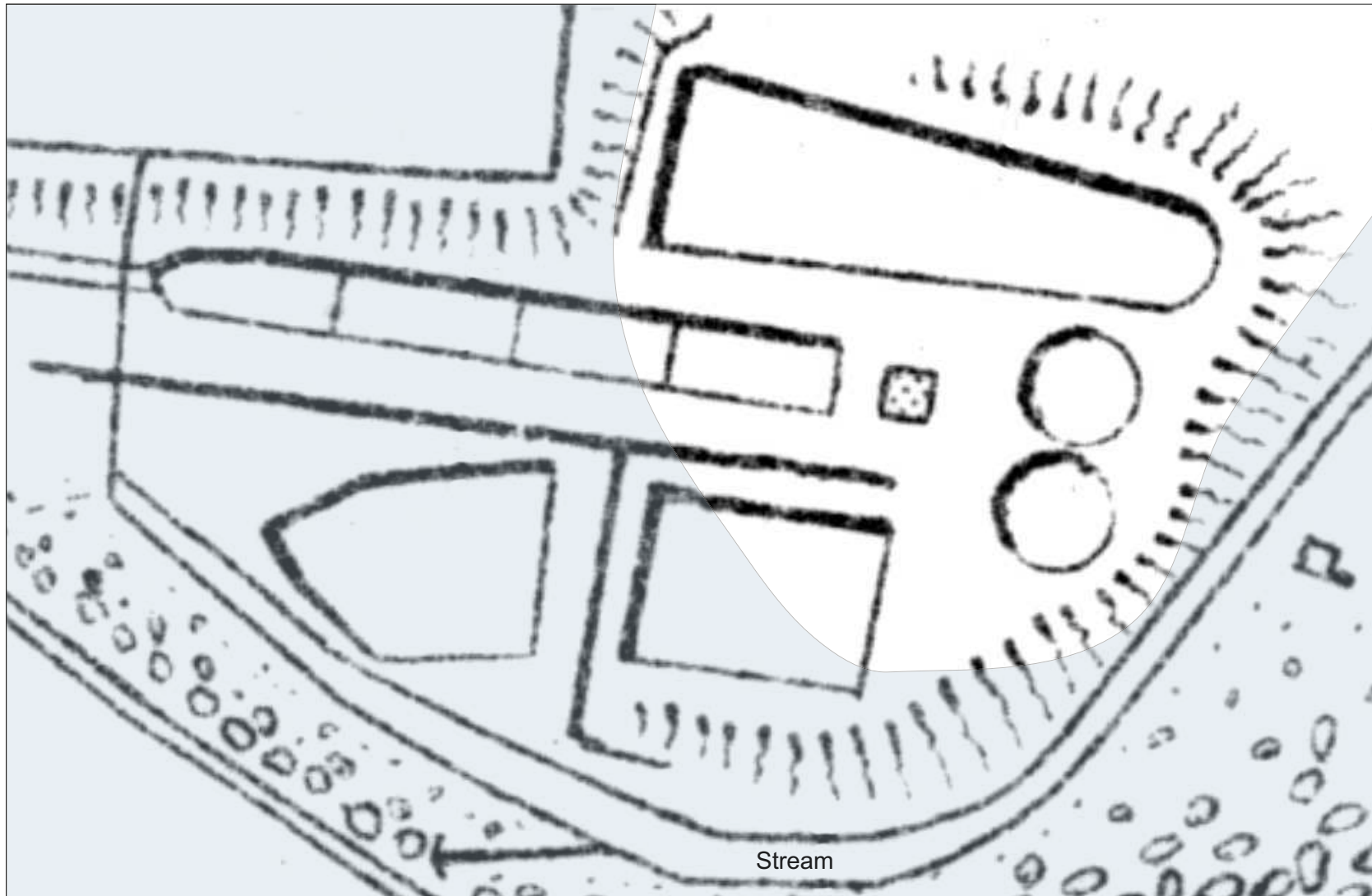
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
PROJECT

Wheal Martyn, 'Upper Processing Plant',
Carthew, near St Austell, Cornwall

TITLE

Fig. 4: Wheal Martyn in 1906, extract from
the OS 25-inch map revision published 1907.
'A' marks the site of the Upper Processing plant



 Areas destroyed or buried since 1906

PROJECT

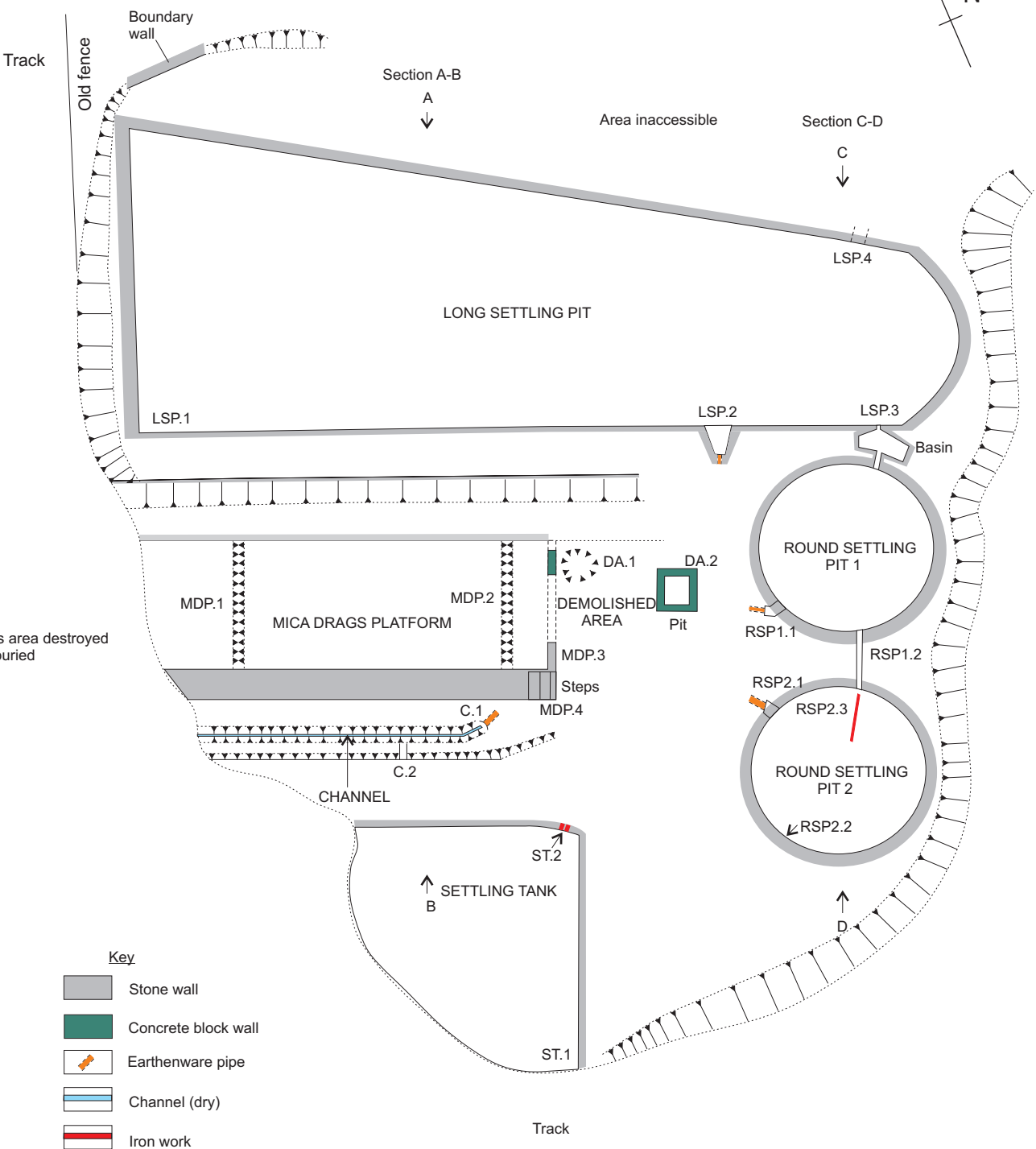
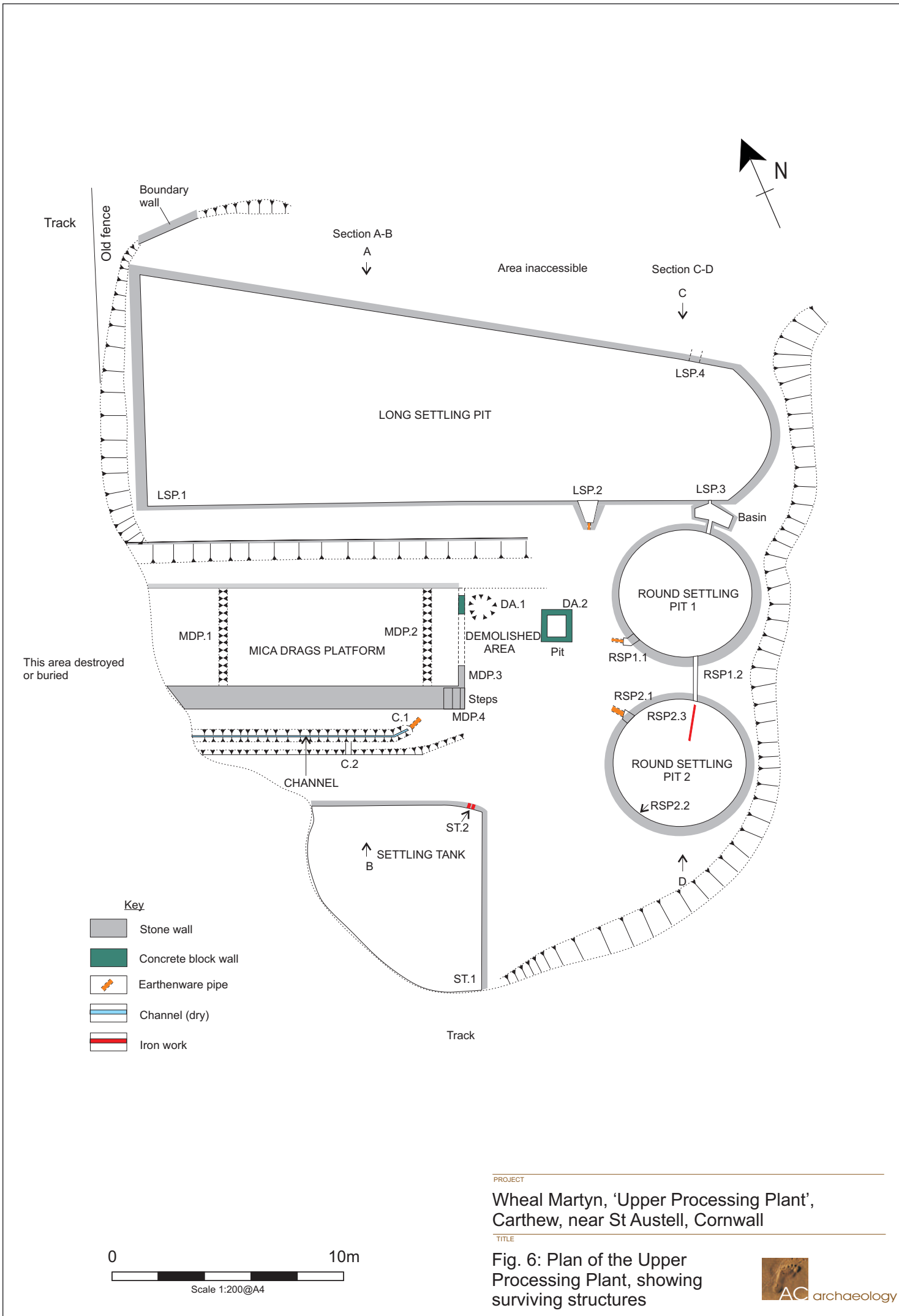
Wheal Martyn, 'Upper Processing Plant',
Carthew, near St Austell, Cornwall

TITLE

Fig. 5: Map of the Upper Processing
Plant in 1906, with shading to show area
since destroyed or buried. Extract from
the OS 25-inch map revision published
1907



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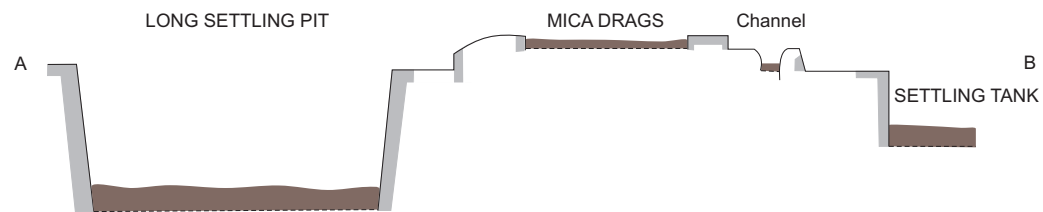


PROJECT
Wheal Martyn, 'Upper Processing Plant',
Carthew, near St Austell, Cornwall

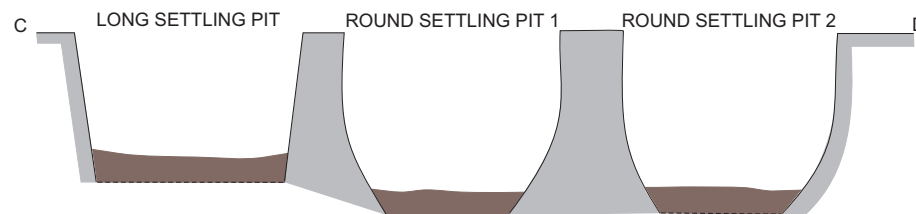
TITLE
Fig. 6: Plan of the Upper
Processing Plant, showing
surviving structures

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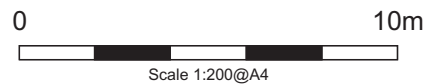
a) Section A-B



b) Section C-D



Stone wall Silt and debris



PROJECT
Wheal Martyn, 'Upper Processing Plant',
Carthew, near St Austell, Cornwall

TITLE
Fig. 7: Sections A-B and C-D of the
Upper Processing Plant



Plate 1: General site view from west, with clay pit track and boulders protecting remains of Settling Tank (1m scale)



Plate 2: Long Settling Pit from east-southeast, showing stone edge along the south side (2m scale)



Plate 3: Long Settling Pit from northwest, showing the south wall, shelf and the raised mica drags area behind (2m scale)



Plate 4: Basin feature between Long Settling Pit (R) and Round Settling Pit 1 (L), from east-southeast (1m scale)



Plate 5: Long Settling Pit interior, squared drain(?) hole (LSP.4) in north stone wall at the east end (0.20m scale)



Plate 6: Round Settling Pits 1 and 2, from west (1m scale)



Plate 7: Narrow groove (RSP1.2) connecting the two round settling pits, from west (1m scale)



Plate 8: Round Settling Pit 2, overgrown internally, from southwest (1m scale)



Plate 9: Round Settling Pit 2, stone coping, iron rod inside and narrow groove between the two pits, from south (1m scale)



Plate 10: Round Settling Pit 2, interior on northeast side with long iron rod (RSP2.3), looking down from south-southwest



Plate 11: Two inflow recesses for pipes to Round Settling Pit 1 (R) and Round Settling Pit 2 (L), with demolished area and mica drags behind, from east (1m scale)



Plate 12: Inflow (RSP2.1) earthenware pipe and wood posts for control hatch, from southeast (0.20m scale)



Plate 13: Settling Tank interior north wall, with low walls of the Channel and Mica Drags stepped up behind, from southeast (2m scale)



Plate 14: Settling Tank interior east wall, with corner on left and dressed stones to the right, from west-southwest (2m scale)



Plate 15: Settling Tank, truncated south end of east wall, providing a cross-section to show construction and dressed stones (2m scale)



Plate 16: View from west of the Channel (or launder), with scale next to earthenware pipe. The Settling Tank is seen on the right and the mica drag platform on left (2m scale)



Plate 17: Earthenware pipe (C.1) detail at end of the Channel, from southwest. The pipe is aligned towards the demolished area (0.20m scale)



Plate 18: View from the west along the top of the mica drag platform towards the east wall (2m scale)



Plate 19: Broken east wall of the mica drag, from west. A possible cross-drain is in the shadow behind the scale. The demolished area and two round settling pits are beyond (2m scale)



Plate 20: Steps (MDP.4) and end of the mica drag platform east wall (damaged to right), from the east (1m scale)



Plate 21: Demolished area, strewn with debris, from east. The cement-lined pit (DA.2) is in the foreground (1m scale)



Plate 22: A possible early dry-stone boundary wall, near the partially hidden Long Settling Tank on bottom right. This view, from southwest, shows the proximity of the Wheal Martyn Museum woodland area beyond the gate on the left (2m scale)

Appendix 1

Digital photographic register

APPENDIX 1: DIGITAL PHOTOGRAPHIC REGISTER

Site Code: ACD 1359

Archive No	Description	Scale	View from	Photo by	Date
	SITE				
1	General view from clay pit track, shows Settling Tank protected with rocks	1m	W	PS	20/04/2016
2	General view, shows gateway into Wheal Martyn Museum site	-	S	PS	20/04/2016
3	General view, site on R & working clay pit beyond track	-	SE	PS	20/04/2016
	LONG SETTILING PIT				
4	Long Settling Pit, south side	2m	E	PS	20/04/2016
5	Long Settling Pit, south side with coping	2m	ESE	PS	20/04/2016
6	Long Settling Pit from west	-	WNW	PS	20/04/2016
7	Long Settling Pit from west, showing raised mica drags platform	2m	NNW	PS	20/04/2016
8	Long Settling Pit south side, gap in coping at west end near SW corner	1m	SE	PS	20/04/2016
9	Long Settling Pit south side, inflow feature	0.2m	S	PS	20/04/2016
10	Long Settling Pit south side, inflow feature showing depth	0.2m	SSE	PS	20/04/2016
11	Long Settling Pit south side, inflow feature earthenware pipe	-	N	PS	20/04/2016
12	Long Settling Pit south side, inflow feature earthenware pipe detail	-	N	PS	20/04/2016
13	Long Settling Pit south side east end, basin feature with Round Pit 1 on left	1m	ESE	PS	20/04/2016
14	Long Settling Pit south side east end, narrow gap into basin feature	0.2m	SSW	PS	20/04/2016
15	Long Settling Pit, interior north wall near east end with drain(?) hole	0.2m	S	PS	20/04/2016
16	Long Settling Pit, interior north wall near east end with drain(?) hole, detail	0.2m	S	PS	20/04/2016
	ROUND SETTILING PIT 1				
17	Round Pit 1 overgrown, with Round Pit 2 beyond	-	NNE	PS	20/04/2016
18	Round Pit 1, leaning edge stones	1m	S	PS	20/04/2016
19	Earthenware pipe in inflow recess	0.2m	E	PS	20/04/2016
	ROUND SETTILING PIT 2				
20	Both round pits, with Pit 2 on right	1m	W	PS	20/04/2016
21	Round Pit 2, overgrown internally	1m	SW	PS	20/04/2016
22	Round Pit 2, rough stone coping detail on east side	-	SSE	PS	20/04/2016
23	Round Pit 2, NE side with iron rod inside and narrow groove between pits	1m	S	PS	20/04/2016
24	Round Pit 2, interior with iron rod	1m	SSW	PS	20/04/2016
25	Iron rod, looking down into Round Pit 2	-	NNE	PS	20/04/2016
26	Groove between Round Pits 1 and 2	1m	W	PS	20/04/2016
27	Inflow recesses to Pit 1 (R) & Pit 2 (L); demolished area & mica drags behind	1m	E	PS	20/04/2016
28	Round Pit 2 inflow earthenware pipe	0.2m	NE	PS	20/04/2016
29	Inflow pipe & wood posts for hatch	0.2m	SE	PS	20/04/2016
30	Round Pit 2 interior, pipe in south side of moss-covered stone wall	-	NE	PS	20/04/2016
	SETTLING TANK				
31	North and east walls, with mica drags	2m	S	PS	20/04/2016

APPENDIX 1: DIGITAL PHOTOGRAPHIC REGISTER

	area above				
32	North wall with low, stepped walls of channel and mica drags beyond	2m	S	PS	20/04/2016
33	Corner of north and east walls	2m	SW	PS	20/04/2016
34	Two iron spikes in N wall, near corner	-	SW	PS	20/04/2016
35	Settling Tank east wall, with corner on L and dressed stones on R	2m	WSW	PS	20/04/2016
36	Truncated east wall, showing section and dressed stones	2m	S	PS	20/04/2016
	CHANNEL OR LAUNDER				
37	Settling Tank N wall, with low walls of channel and mica drags stepped to R	2m	SE	PS	20/04/2016
38	Channel, with retaining wall & Settling Tank on R, & Mica Drags wall on L	2m	W	PS	20/04/2016
39	Channel, with retaining wall & Settling Tank on R, & Mica Drags wall on L	2m	W	PS	20/04/2016
40	Overflow across retaining Channel wall	1m	S	PS	20/04/2016
41	Channel overflow in front, earthenware pipe R & mica drags wall behind	1m	SW	PS	20/04/2016
42	Earthenware pipe detail	0.2m	SW	PS	20/04/2016
	MICA DRAGS				
43	Raised mica drags platform area	2m	NW	PS	20/04/2016
44	Long view along top towards east wall	2m	W	PS	20/04/2016
45	Broken east wall, with possible cross-drain in shadow behind scale	2m	W	PS	20/04/2016
46	SE corner near steps & wall. Possible cross-drain in shadow in foreground	-	NW	PS	20/04/2016
47	Steps and wall, damaged on right	1m	E	PS	20/04/2016
48	Steps and wall	1m	ESE	PS	20/04/2016
49	Area of mica drags, viewed along top	2m	E	PS	20/04/2016
50	Damaged stone edge of S side of mica drags platform	1m	W	PS	20/04/2016
51	Possible cross-drain near west end	1m	N	PS	20/04/2016
52	Possible cross-drain near west end	1m	E	PS	20/04/2016
	DEMOLISHED AREA				
53	Demolished area, with strewn debris and cement-lined square pit in front	1m	E	PS	20/04/2016
54	'Carbis' brick, fallen in pit	0.2m	-	PS	20/04/2016
	SQUARE PIT (DA.2)				
55	Pit, demolished area & micas behind	1m & 1m	E	PS	20/04/2016
56	Cement-lined square pit	1m	E	PS	20/04/2016
57	Square pit and Round Pit 1	2m	W	PS	20/04/2016
	BOUNDARY WALL				
58	Earlier dry-stone wall, and Long Settling Pit bottom R	2m	SW	PS	20/04/2016
59	Dry-stone wall and gateway to Wheal Martyn Museum track beyond on L	2m	S	PS	20/04/2016
	IRON PIPE (RSP2.3)				
60	Cast-iron working barrel pipe 9ins internal diameter, not in situ	1m	NE	PS	20/04/2016
61	Cast-iron working barrel pipe 9ins internal diameter, detail	1m	NE	PS	20/04/2016

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